Alexandra parrakeet, discovered during the Stuart Expedition into central Australia in 1862; the paradise parrakeet, classed with the golden-shouldered parrakeet as the most lovely of all the Australian parrakeets; and the splendid parrakeet the wonderful colours of which, as well as those of the species last mentioned, are displayed on two of the plates.

It has been the aim of the author to make the present book a complete monograph of the imported species of parrakeets. New species may be expected to arrive from time to time. For instance, when the first part of the work was issued no living specimen of the varied lorikeet (*Ptilosclera versicolor*) had ever been known in this country, but a few months later a few pairs reached London, and this species has accordingly been included (with a coloured plate) in the appendix, in which additional information respecting several other parrakeets is to be found. O. V. A.

MULTIPLICATION TABLE.

Table of Multiplication, Division and Proportion for the Ready Calculation of Quantities and Costs, Estimates, Invoice Prices, Interests and Discounts, Weights and Strengths, Wages and Wage Premiums. By Robert H. Smith, M.I.M.E., &c. (Westminster: Archibald Constable and Co., Ltd., 1903.) Price 6*s.* net.

THIS consists simply of a gigantic multiplication table for every figure up to 100 times 160, there being 100 horizontal lines of products arranged in 160 vertical columns on a sheet 5 feet long and 11½ inches wide. The sheet is mounted like a map upon canvas, so as to open at any part of the length and exhibit two pages, each page containing 10 vertical columns indexed right and left with every 10th number up to 100. To guide the eye wider spacing is provided at every fifth line and column, and still wider at every tenth, as in logarithm tables. The index numbers are equivalent to a repetition of the first column on every page, so that any line up to the 100th can at once be found. As in any other multiplication table, the figure found at any place is the product of the first figure on the line and the top figure of the column on which it is found.

On the back of the sheet are a corresponding series of pages on which Prof. Smith has explained how the table may be used for all the purposes described in the title.

If two numbers have to be multiplied together the product can, of course, be read directly if they do not exceed 100 and 160, but if that was all the table was for, even though it is well arranged, it would hardly be worth getting out of its place. If only one of the figures exceeds these by not more than two digits, it may be broken up into two parts, *e.g.* 3781 into 3700 and 81, and the two partial products read, preferably in a single column when that is possible, and mentally added. If both factors exceed these amounts then four partial products have to be found, and two columns must be employed, which may be on different pages. This necessitates writing down the four partial products of probably four digits each, and taking care that the units place is properly placed in each. Then on adding, the product is found exact, of course to the last figure. It is not worth while in this notice to refer to rules or practice as to placing the decimal point if the factors contain decimal figures.

Division, of course, is performed by finding the quotient in the body of the table on the line or column of which the first figure is the deviser. Then the quotient will be the first figure of the column or line. This is only possible when the dividend is an exact product of two numbers not exceeding 100 and 160. Of course, in practice it never is, and then interpolation is necessary. Prof. Smith gives two methods. Where, however, both the diviser and quotient exceed 100 and 160 the double interpolation necessary seems to the writer to involve so much trouble, and to provide such opportunity for mistakes, that he would prefer to perform the operation with a pencil and paper in the usual way of the school if slide rules, logarithm tables, or calculating machines were not sufficient or available.

Simple proportion can, of course, be performed where the four quantities are all actually existing in the table by direct inspection, but again, in practice they never would be, and interpolation, either single or double, would be necessary.

The other processes described in the title which involve one or other of these operations are explained in the text on the back. It might very well be that for certain classes of calculation or of office work where the computer or clerk had the same kind of thing to do indefinitely, the table would afford the readiest means of finding an exact result, but for general use by people who could not for want of practice be quite adept, it is a question whether the constantly recurring interpolation complication would not give more trouble than direct arithmetic, besides leading to endless mistakes. C. V. B.

THE ZOOLOGICAL RECORD FOR 1902.

The Zoological Record, vol. xxxix., relating chiefly to the Year 1902. Edited by D. Sharp. (London: Zoological Society, 1903.)

ALTHOUGH on the title-page this volume, which slightly exceeds its predecessor in bulk, bears the date 1903, as a matter of fact it was not in the hands of the public until the beginning of the present year. This slight delay, as the editor informs us, is more than accounted for by certain unexpected changes in the staff of recorders, notably the loss of the services of Prof. J. A. Thomson, who has felt himself compelled to relinquish the compilation of that very important section of the undertaking entitled "General Subjects." His place, apparently at short notice, has been taken by the editor, who, in addition, is responsible for the insects, as well as for the general supervision of the whole text, and must therefore have had very hard work to complete his task so nearly within the appointed time-limit. The other contributors the

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loss of whose cooperation the editor has to deplore are Prof. Herdman and Mr. W. A. Brown.

In these circumstances, we have to offer special congratulations to Dr. Sharp on the appearance of this volume. We may at the same time take the opportunity of mentioning our satisfaction at the decision of the council of the Zoological Society to continue, at all events for the present, the publication of this invaluable record. Without in any way disparaging the "International Catalogue of Scientific Literature," it is quite certain that, in present circumstances, the zoological portion could not be issued with that promptness which renders the "Record" before us so invaluable to working naturalists.

Since all the contributors are specialists, thoroughly acquainted with their respective subjects, there is little or nothing to criticise in the *technique* of their work, and the present volume seems remarkably free from typographical errors. As usual, some of the recorders treat their subject, both in the way of introduction and in the class of papers quoted, at much greater length than others. In some sections—the mammals, for example—it appears to be the recorder's custom to exclude papers which do not contain absolutely new matter, and also those in which there is merely more or less incidental allusion to the particular subject, or summaries of previous work. In other sections—like the one on echinoderms—precisely the opposite course is followed, papers containing even the most remote and unimportant references to the subject being catalogued. Consequently, some of the pages in the section last cited look more like a geological than a zoological record.

It is not, of course, for us to decide which course is preferable. If, however, the more comprehensive plan is necessary in one section, it is apparently required in all, and *vice versâ*. The universal adoption of the fuller plan would largely increase the bulk of the annual volume, while if the system of elimination were followed throughout, its size would be proportionately reduced.

As an instance of our meaning, we may note that some writers quote the articles on their respective subjects from the volumes of the "Victoria County History," while by others they are omitted. Again, in one section (Echinoderms) we find the "Guide to the Dublin Museum" entered, which is surely unnecessary. In the same record also occurs Prof. Sollas's paper on the method of investigating the structure of fossil animals by means of sections, a paper which should have appeared only in "General Subjects," where it is conspicuous by its absence.

How absolutely essential to zoological workers—if they are to avoid using preoccupied names—is the prompt appearance of the "Record" may be inferred from the long list of new generic and subgeneric terms at the end of the present volume, which runs to 18 pages, against 16 in its predecessor.

In conclusion, we may direct attention to the request that authors would send copies of their papers to the editor. Labour would thus be saved to the recorders, and the prompt insertion of papers would be secured.

R. L.

OUR BOOK SHELF.

Æther and Gravitation. By W. G. Hooper. Pp. xiv+358. (London: Chapman and Hall, Ltd., 1903.) Price 12*s*. 6*d*. net.

FROM a psychological point of view this treatise of 358 pages is very interesting. The author "has endeavoured to perfect a theory which will bring ætherial physics more into harmony with modern observation and experiments." He "has taken Newton's Rules of Philosophy as his guide in the making of the new theory, as he believes that if any man knew anything of the Rules of Philosophy, that man was Sir Isaac Newton."

These rules are:—

(1) "Simplicity of conception." "If there are apparently two causes to the same phenomenon, then the simpler cause is the true and correct one."

(2) "Agreement with experience, &c."

(3) "Satisfactorily accounting for and explaining all phenomena sought to be explained."

These rules are first applied to gravitation. "The Law" (of gravitation) "is not a simple law. It is compounded primarily of three parts. 1st, a primitive impulse; 2nd, a centripetal force; 3rd, a centrifugal force. To these must be added the three laws of motion."

No known medium has been found to be absolutely frictionless. "Accepting therefore experience as a guide we are compelled to come to the conclusion that there is no such thing in the Universe as a frictionless medium. Such a hypothesis is contrary to all laws and rules of Philosophy," "and therefore as either experience or a frictionless medium has to go, we will part with the frictionless medium." "With the present conception of a frictionless æther, however, it is philosophically impossible for the æther to exert force on any body that may exist in it. Because to the extent that it is frictionless, to that extent it ceases to possess mass. If it does possess mass, then it cannot be frictionless."

The next point dealt with is matter, which is thus defined:—"Matter is that which can be perceived by the senses, or is that which can be acted upon by motion, or which can exert motion."

Incidentally we learn that vortex atoms cannot be cut in two. "It will be found that when the knife is brought near to them they seem to recoil from the knife."

Chapter iv. is entitled "Æther is Matter." In this chapter we learn something of the constitution of atoms.

"If therefore it holds good in Philosophy that the small things are the index to the greater, then the converse holds good, that what is true of the large is true of the small, and that the laws governing the great also govern the small." "So that gathering up those chief properties of the earth to which I have already referred, and applying them to an ætherial atom, or any other atom if necessary, we arrive at the conclusion that an atom must be spherical in shape, must possess rotation, and must have an orbit, must possess polarity, and also be subject to the universal Law of Gravitation." "Further, if we are to be strictly correct, in our analogy between the earth and the ætherial atom, its polar diameter must be shorter than its equatorial diameter, as that is one of the facts observable regarding the shape of our earth."

Similar lines of argument are applied in succeeding chapters to heat, light, electricity, and the universe in general. The author has read many books. He has not always succeeded in understanding them.

W. M. H

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